

GAO

Report to the Chairman, Subcommittee  
on Defense, Committee on  
Appropriations, House of  
Representatives

April 2000

# DEFENSE ACQUISITIONS

## Need to Revise Acquisition Strategy to Reduce Risk for Joint Air-to-Surface Standoff Missile



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United States General Accounting Office  
Washington, D.C. 20548

National Security and  
International Affairs Division

B-283201

April 26, 2000

The Honorable Jerry Lewis, Chairman  
Subcommittee on Defense  
Committee on Appropriations  
House of Representatives

Dear Mr. Chairman:

This report responds to your request that we review the Air Force's and the Navy's development of the Joint Air-to-Surface Standoff Missile and the recent extension of the program's development schedule. The missile is the successor of the Tri-Service Standoff Attack Missile, which was canceled because of its high projected unit cost—over \$2 million each—and because development costs had grown to over \$4 billion. Rather than modifying another weapon to meet their requirements, the Air Force and the Navy believed that they could rely on existing technologies and improved acquisition strategies to develop a lower-cost weapon more rapidly than previous missile acquisition programs.

Less than a year after approving the Joint Air-to-Surface Standoff Missile's engineering and manufacturing development schedule, the Air Force extended the development schedule, delaying the beginning of production and increasing the cost estimate. As you requested, we reviewed the program to determine (1) what the program's status is and what the causes of the schedule slip and cost increase were and (2) whether the Air Force is following the most effective acquisition strategy to reduce the risk of cost growth and schedule delays.

## Results in Brief

Since the program's inception, the development schedule has lengthened from 56 months to 78 months, and total program costs have increased from \$1.6 billion to \$2.1 billion.<sup>1</sup> In the most recent extension, approved in

<sup>1</sup>Initial estimates placed development costs at \$675 million and procurement costs between \$960 million and \$1.68 billion because the development contractor had not been selected. We used the lower procurement cost because it was closer to the winning contractor's proposal. In the most recent program estimate, development costs were \$892 million and production costs \$1.21 billion.

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November 1999, the Air Force added 10 months to the missile's development schedule and increased estimated program costs by about \$90.1 million. Factors leading to the schedule delay varied and included prime and subcontractor changes to missile design to (1) correct problems discovered during testing, (2) decrease production costs, or (3) improve performance. Program officials stated that contractors underestimated the time and personnel required to design the missile and prepare for production.

The Air Force employed acquisition reform strategies, such as using technologies already proven in other systems and establishing a cost goal as an independent requirement, which helped reduce overall development time and costs. As a result, the current 78-month development program time frame is substantially less than the historical average of 118 months for other missile programs. Also, the missile's production unit cost is projected to be well under the price limit. However, the program is still vulnerable to significant cost increases and schedule delays because the design of some components is not yet stable. Further, the missile production prices within the Joint Air-to-Surface Standoff Missile contract are based on starting production by a specific date but without adequate assurance that the missile will be ready for production by that date. The Air Force will not have specific, detailed knowledge of the missile's ability to meet its performance requirements until after production is scheduled to start. Also, there is much engineering and development work to be done to obtain full assurance that the missile production processes are under control and that the production line is producing the quality and volume of needed missiles.

We recommend that the Air Force revise its acquisition strategy for the Joint Air-to-Surface Standoff Missile program to move away from an arbitrarily set production date to one that is more closely linked to the attainment of knowledge that the missile design is stable, the missile can meet performance requirements, and the production line can produce the needed missiles.

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## Background

The Joint Air-to-Surface Standoff Missile (JASSM) is an air-delivered, long-range weapon for use outside enemy area defenses. It is a weapon expected to be heavily used in the early stages of a conflict to attack targets such as communication centers and integrated air defense sites so that enemy air defenses can be suppressed. The Air Force and the Navy are jointly developing JASSM at a currently estimated cost of \$892 million, with

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the Air Force as the lead service. The Air Force plans to spend about \$1.2 billion procuring 2,400 JASSMs. The Navy has not allocated any funding in its future years' defense planning budgets to procure the JASSM, but Navy officials stated that they are still considering the possibility of some procurement.

The program has completed the initial phase of development and is over 1 year into the second development phase—engineering and manufacturing development.<sup>2</sup> The initial production decision is expected to be made, and the contract option exercised, by November 2001. Independent operational testing to verify the operational effectiveness of the weapon is scheduled from February through December 2002.

In the past, weapon programs often experienced cost overruns and schedule delays because they were based on unproven or immature technologies, or they made design changes late in development and entered production prematurely. In our recent work, we analyzed the practices commercial firms use to reduce the time spent developing products and bringing them into production.<sup>3</sup> We found that commercial firms center their development and production decisions around the attainment of three areas of knowledge before production begins: (1) knowledge that the technology to fulfil the requirements is mature; (2) knowledge that the design is stable and will work as required; and (3) knowledge that the design can be produced within cost, schedule, and quality requirements.

The Under Secretary of Defense for Acquisition and Technology has called for reforms to substantially reduce the time needed to move a weapon system from development to production—the cycle time. Historically, the average cycle time for precision-guided missiles has been 118 months. To reduce cycle time, the Department of Defense (DOD) has approved a

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<sup>2</sup>DOD manages weapon programs in three stages: (1) program definition and risk reduction, (2) engineering and manufacturing development, and (3) production. During program definition and risk reduction, called Milestone I, the program is defined and various concepts and technologies are investigated. During engineering and manufacturing development, Milestone II, the design is chosen, manufacturing processes are validated, testing begins, and low-rate initial production occurs. At production, Milestone III, testing verifies that the weapon is suitable and effective for operations, deficiencies encountered in testing are resolved, and fixes are verified.

<sup>3</sup>*Best Practices: Successful Application to Weapon Acquisitions Requires Changes in DOD's Environment* (GAO/NSIAD-98-56, Feb. 24, 1998) and *Best Practices: Better Management of Technology Development Can Improve Weapons System Outcomes* (GAO/NSIAD-99-162, July 30, 1999).

number of acquisition reforms that include reducing the amount of data contractors are required to deliver, eliminating the use of military standards and specifications, allowing the use of commercial components, and forming working groups composed of both government and contractor personnel to coordinate development activities such as testing.

## Design and Manufacturing Problems Have Delayed Development and Increased Costs

Since the program's inception, the development schedule has lengthened from 56 months to 78 months, and program costs have increased from \$1.6 billion to \$2.1 billion. In the most recent extension, approved in November 1999, the Air Force added 10 months to the JASSM development schedule and increased estimated program costs by about \$90.1 million. Factors leading to the schedule delay varied and included prime and subcontractor changes to missile design to (1) correct problems discovered during testing, (2) decrease production costs, or (3) improve performance. Program officials stated that the contractors underestimated the time and personnel required to design the missile and prepare for production. The estimated development cost increased by \$38.2 million as a result of the time added to the schedule and additional developmental flight hardware. Estimated production costs increased by about \$51.9 million mostly because of the schedule slip that moved the beginning of production past the date specified in the contract and required prices of production quantities to be renegotiated.

At the program's inception, the Air Force planned to develop the missile and begin production in 56 months. The Air Force's strategy was to conduct a competitive 24-month program definition and risk reduction phase with two contractors. The contractors' tasks during this phase were to design the missile and demonstrate that the design worked. The Air Force was to select one of the two contractors to complete development testing, establish production processes, and begin production during a 32-month engineering and manufacturing development phase. The program definition and risk reduction phase actually lasted 28 months, and the transition to one contractor was made before the end of that phase. The engineering and manufacturing development phase was lengthened to 40 months in November 1998, when the program was reviewed for approval to enter engineering and manufacturing development. Table 1 shows the schedule and costs just before and after the latest slip.

**Table 1: Changes in JASSM Schedule and Costs**

Dollars in millions		
Event	Program before schedule delay	Program after schedule delay
Total development time	68 months	78 months
Engineering and manufacturing development	40 months	50 months
Low-rate production approval	January 2001	November 2001
Last developmental test flight	March 2001	February 2002
Development cost	\$853.8	\$892.0
Procurement cost	\$1,157.5	\$1,209.4

Sources: Defense Acquisition Executive Summary, June 1999, and Selected Acquisition Report, December 1999.

## Program Schedule Delays

The schedule delays were caused by a combination of (1) underestimating the time and personnel required for the engineering and manufacturing development effort, (2) late deliveries of components to the prime contractor, and (3) increasing the time between flight tests and adding two flight tests. Generally, subcontractor deliveries were late due to design and manufacturing problems. Some of these problems originated with the prime contractor, others with the subcontractors. Three missile components that required significant development efforts—the engine, the airframe shell, and the wing deployment actuators—all experienced design and manufacturing difficulties, as well as related schedule slips, caused by both the prime contractor and the subcontractors.

The prime contractor requested changes to the engine design in order to achieve cost goals and improve performance. According to program officials, the basic engine design had been used in other missiles, but the subcontractor had not developed a new engine in several years and underestimated the work needed to make the desired design changes. As a result, the subcontractor has not met the delivery schedule, delaying the assembly of development missiles.

The subcontractor for another critical missile component—the airframe shell—has also been unable to meet the delivery schedule for several reasons. First, the prime contractor changed the design of the outer mold line to improve the missile's performance in dropping away from the aircraft. Second, the subcontractor had problems with manufacturing processes due at least in part to lack of experience with the process used to

build the missile shell. According to program officials, the molding process was new to the subcontractor, who could not initially produce missile shells with consistent quality, and the shells sometimes had to be hand-finished. Third, one of the suppliers had difficulties casting missile frames with consistent quality.

Subcontractors for the wings also spent an unexpectedly long time resolving technical issues. According to program officials, one significant problem has been stabilizing the production configuration of the wing deployment actuators, which control the movement of the missile. During testing, designers believed that the actuators allowed the missile's wings to come out with too much force. As a result of this problem, the subcontractor spent considerable time redesigning and testing a new actuator design.

Program officials told us that they expected deliveries of all missile sub-components, including the engine, the shell, and the actuators, to be back on schedule by the end of December 1999. As of January 2000, the airframe shell deliveries were on schedule, but deliveries of the engine and wing actuators had fallen further behind schedule (see table 2).

**Table 2: Status of JASSM Sub-component Deliveries**

Sub-component	Deliveries behind schedule October 1999	Deliveries behind schedule January 2000
Engine	2	3
Airframe shell	6	0
Wing deployment actuator	13	23

Program officials were not definite about when deliveries of the other sub-components would be back on schedule, but they stated that they expected this to happen within a few months. Final assembly of developmental missiles will continue to be delayed until these components are delivered.

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## Program Costs Increased by \$90 Million

The most recent schedule delay increased JASSM development costs by \$38.2 million and production costs by \$51.9 million. According to program officials, development costs increased because of the additional 10 months of development effort and the increased contractor personnel needed for additional design work and test management. More than two-thirds of the \$51.9-million production cost increase—\$36 million—resulted from a negotiated increase in the price of the missiles in the first five production lots because the government would not exercise the first production option as originally scheduled. The contractor and the government have agreed to a 4.99-percent price increase to the fixed price of the first five lots plus the cost of extending the schedule for 10 months, for a total of about \$36 million. The remaining \$15.9 million production cost increase was due to DOD revising inflation indexes and reducing the quantities of missiles purchased.<sup>4</sup> According to the Air Force, reductions or additions to quantities in the first five lots will raise the unit cost of each missile in those lots.

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## Acquisition Reforms Have Been Used to Accelerate Development, but Significant Risks Remain

Although the Air Force employed acquisition reforms to accelerate JASSM development and contain program costs within established guidelines, the program is still vulnerable to significant cost increases and schedule delays because the missile's design has not yet been stabilized. Further, the missile production prices within the JASSM contract are based on a specific production starting date but without adequate assurance that the missile will be ready for production by that date. Our examinations of best practices by commercial firms have shown that the risk of cost increases and schedule delays is reduced significantly if production decisions are linked to having mature technology, stable designs, and proven manufacturing capabilities rather than to specific points in time.

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## Acquisition Reforms Accelerated Missile Development

The Air Force has implemented a streamlined acquisition strategy that incorporates reforms intended to reduce time spent designing a weapon system by eliminating unneeded military standards and specifications, relying on mature technologies, and limiting changes in performance requirements. As a result, the current 78-month development time frame

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<sup>4</sup> The Air Force originally planned to procure 1,165 missiles with the first five production lots, but it reduced the number to 1,128.



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for the JASSM program represents a substantial reduction from the historical average of 118 months for other programs.

In contrast to many acquisition programs that have required advances in technology to meet performance requirements, the JASSM program's goal was to use a derivative of an existing missile design with proven technologies rather than new technologies. The initial program definition phase was intended to verify the capability of the design to meet performance requirements, trade off performance requirements for cost, and develop manufacturing processes to build the missile in a cost-efficient manner.

By the end of the program definition phase, the government required competing contractors to be ready to build the system for development and operational testing. Several major reform initiatives helped contractors focus their efforts. For example, in keeping with acquisition reforms that stress greater government/private sector coordination and less direct government oversight, the Air Force considered the winning contractor responsible for missile design, developmental testing and evaluation, and tracking design changes. Instead of assuming its traditional oversight role, which usually involves requirements that contractors submit large quantities of data, the government reduced the amount of data required and established teams of government and contractor personnel to resolve problems jointly. According to program officials, these teams have proven adept at maintaining JASSM development on schedule because they have worked to prevent addition of requirements that could drive changes to the missile's design.

JASSM was also designated as one of the first programs to use the concept of cost as an independent variable. The concept gives contractors the flexibility to trade off specific performance features to achieve established cost objectives. The JASSM program has had success in staying within established cost goals because the Air Force and the Navy limited specific performance requirements to a few key areas—range, mission effectiveness, and suitability for Navy carriers. For example, the JASSM program reduced the missile's cost by not requiring it to be launched under the most extreme speed, altitude, or other conditions that each aircraft can generate. Instead, a common set of launch conditions was established for a variety of aircraft. The operational requirements document established a ceiling of \$700,000 (in base year 1995 dollars) for the average unit procurement price. The currently projected average unit procurement price for the first five lots of production missiles is about \$327,000, well under the price limit.

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## Risks of Cost Increases and Schedule Delays Remain

Despite the significant steps taken to accelerate the development program, the program is not adequately linked to knowledge that the missile design is stable, the missile will perform as required, and the manufacturing processes are under control. As a result, the program is vulnerable to further cost increases and schedule delays. Our past work has shown that DOD can reduce cost and schedule risks in weapon system acquisition programs by developing an acquisition strategy that centers on the government and the contractor obtaining specific and timely knowledge of (1) the maturity of the technology needed to meet established requirements, (2) the stability of the design and its ability to meet performance requirements, and (3) the ability of the production processes to deliver quality items within cost and schedule agreements. In response to our reports, the Office of the Under Secretary of Defense for Acquisition and Technology agreed with these concepts and stated that DOD would establish specific standards for technology design and production knowledge points and apply them to weapon system acquisition programs.

Although the Air Force did not specifically organize the JASSM acquisition strategy around these knowledge points, the program has taken steps to achieve one of them—knowledge that mature technologies are available to meet performance requirements. These efforts have reduced technology risk—usually the most problematic one—significantly. The Air Force has not achieved the other two knowledge points even though commercial firms usually expect to achieve the second point—knowledge that the design is stable and will meet performance requirements—about halfway through product development. The JASSM program is currently beyond the halfway point in its product development phase. This lack of knowledge of the missile's design, while less critical than the first point, is the result of the contractor underestimating the efforts required to manage the design and is the direct cause of current cost and schedule problems. Further, the program cannot expect to obtain knowledge of manufacturing processes until the design's stability and its ability to meet requirements are known.

## Knowledge That the Technology Is Mature Was Obtained

The technologies required to meet the missile's key performance characteristics were mature enough to reduce risk at the beginning of the engineering and manufacturing development phase. The Air Force used performance-based requirements and allowed the contractor to determine how the requirements were to be met rather than having the government tell the contractor how to accomplish the required performance. Also, the contractor was encouraged to use tested commercial technology, as well as technologies already used in other military systems, to complete the

design. The major components of the missile have been used in other products or are in an advanced stage of development (see table 3). When DOD approved the decision to proceed to engineering and manufacturing development, the contractor had already achieved this first knowledge point.

**Table 3: Production History of Selected Components**

Component	Previous use
Engine	Standoff Land Attack Missile—Expanded Response, Harpoon
Airframe technology	Boating industry
Infrared seeker	Javelin command and launch unit
Inertial measurement unit	Joint Direct Attack Munition, Joint Standoff Weapon

#### Uncertain Design Stability and Untested Performance Raise Risks

The contractor has not obtained knowledge that the design is stable and meets requirements. Commercial firms expect that halfway through product development, they will have conducted a critical design review and that 90 percent of all engineering drawings for the entire product and its component parts will be completed. According to Air Force officials, a design review of JASSM was conducted in March 1999, about halfway through product development. The review found that about 80 percent of engineering drawings for the entire missile were complete but that only a small percentage of drawings for the missile sub-components were. Moreover, additional design changes were still being made to some missile components in October 1999.

Although the government and the contractor have conducted extensive component-level testing, the contractor is not expected to have specific, detailed knowledge of the design's ability to meet requirements until after the decision to begin production has already been made and the contract option has been exercised. According to contract provisions, the low-rate initial production option is required to be exercised by a particular date to maintain prices unchanged, but the date is not based on the accumulation of specific knowledge of the product being developed.

The contractor originally planned to have greater knowledge of how the design would work earlier in the program. The program definition phase was to include three test flights of a prototype missile, but the flights were

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postponed. The first flight in April 1999 (after the beginning of engineering and manufacturing development in November 1998) failed because an electrical current leak from the battery resulted in flight termination. A second test flight in August 1999 and a third in November 1999 demonstrated that the missile separated from the aircraft, acquired guidance from the global positioning system satellites, started its engine, and flew a predetermined 180-mile course to attack a target. Only after these test flights did the contractor have some assurance that the missile could meet its basic performance requirements. Getting to this point, however, required a series of unanticipated design changes relatively late in the missile's development.

#### Production Processes Are Unproven

Some components of the missile have stable production processes, but others do not yet have them because their production configuration is not final. Also, the production processes for the complete missile are not yet final. There is much engineering and development work to be done to obtain full assurance that production processes are under control, the production line is producing the quality and volume of production units needed, and the costs are within program projections. For example, engine and wing actuator deliveries are still behind schedule (engines are a major component of the missile and among the first to be installed). Late deliveries delay the development of production processes, creating inefficiencies and making it more difficult to control production processes.

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#### Conclusions

The Air Force has adopted acquisition reform initiatives that have significantly accelerated the development program and contained the production price of the missile within established guidelines. The Air Force has taken steps to link production decisions for the Joint Air-to-Surface Standoff Missile to critical knowledge of the missile's design stability, tested performance, and demonstrated manufacturing capabilities. However, if it exercises the current contract options, the Air Force may begin production without assurance that the government or the contractor will know enough about whether the design meets requirements or can be produced. As a result, the program will be vulnerable to future cost increases and schedule delays if the contractual provisions are exercised before critical knowledge is obtained related to the missile's design stability, tested performance, and demonstrated manufacturing capabilities.

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## Recommendation

We recommend that the Secretary of Defense direct the Air Force to revise its acquisition strategy for the Joint Air-to-Surface Standoff Missile program to link production decisions more closely to knowledge points. In revising its strategy, the Air Force should take steps to ensure that before beginning initial production (1) the missile design is stable; (2) flight testing fully establishes the missile's ability to meet performance requirements; and (3) key manufacturing processes are under control so that the quality, volume, and cost of their output are proven and acceptable.

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## Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD generally agreed with our recommendation, stating that the current acquisition strategy for the Joint Air-to-Surface Standoff Missile meets the objective of our recommendation that production decisions be closely linked to design, performance, and production knowledge points. DOD stated that these knowledge points are directly linked to specific criteria established for making the low-rate initial production decision and that the contractor is required to meet this criteria. DOD agreed, however, that there is cost risk associated with the missile's contracts that contain production options to be exercised on or before a certain date. DOD stated that it was working with the contractor to reduce this risk.

We agree that the Air Force has taken steps to link production decisions for the Joint Air-to-Surface Standoff Missile to the knowledge points described in our report and have revised our report to clarify this point. However, we do not believe that the specific criteria established to support the production decision are sufficient to minimize cost and schedule risks. For example, the Air Force will not have completed developmental flight tests related to the missile's performance (1) against hard targets and (2) when launched from the B-52. In addition, although the Air Force may be able to demonstrate that missiles can be produced at the production facility, this does not necessarily demonstrate—as called for in the third knowledge point—that missiles can be produced within cost, schedule, and quality requirements. Moreover, we continue to be concerned about the pressure to exercise the current contract options to start production at a fixed time, even if sufficient knowledge about the missile has not yet been obtained. We believe our recommendation is still valid and needed to more closely link production decisions to knowledge points.

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We incorporated DOD's technical comments into our report where appropriate. DOD's written comments are reprinted in their entirety in appendix I.

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## Scope and Methodology

To understand and determine the causes of recent JASSM schedule delays and cost increases, we interviewed program officials and contractor personnel at Lockheed Martin Integrated Systems and reviewed program schedules, program management assessments, and cost performance reports. We analyzed schedule variances and obtained explanations for the differences.

To determine whether the Air Force is following the most effective acquisition strategy to reduce risk, we interviewed program officials and officials from the Office of the Under Secretary of Defense for Acquisition and Technology, about program elements affected by acquisition reform. We compared their answers with the description of commercial best practices contained in our previous work on the subject. We compared best practices criteria to the current program status to determine whether JASSM development is following best practices and where following best practices would help reduce risk.

We interviewed officials from the Office of the Director, Program Analysis and Evaluation, Cost Analysis Improvement Group, from Lockheed Martin Integrated Systems, and from the JASSM Program Office.

We visited the Office of the Secretary of Defense, Program Analysis and Evaluation, Washington, D.C.; the Office of the Under Secretary of Defense for Acquisition and Technology, Washington, D.C.; the Navy Aviation Requirements Branch, Washington, D. C.; the Aeronautical Systems Center, Eglin Air Force Base, Florida; Lockheed Martin Integrated Systems, Orlando, Florida; and the JASSM Production Facility, Troy, Alabama.

We performed our review from July 1999 through April 2000 in accordance with generally accepted government auditing standards.

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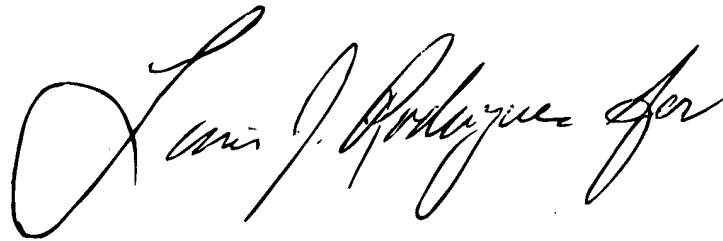
We are sending copies of this report to other interested congressional committees; the Honorable William S. Cohen, Secretary of Defense; the Honorable F. Whitten Peters, Secretary of the Air Force; the Honorable Richard Danzig, Secretary of the Navy; General James L. Jones, Commandant of the Marine Corps; and the Honorable Jacob L. Lew,

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Director, Office of Management and Budget. We will also make copies available to others upon request.

If you or your staff have any questions concerning this report, please call me on (202) 512-4841. Key contributors to this report were Tana M. Davis, William R. Graveline, and Carol T. Mebane.

Sincerely yours,

A handwritten signature in black ink, appearing to read "James Wiggins for". The signature is fluid and cursive, with a large initial "J" and "W".

James Wiggins  
Associate Director  
Defense Acquisition





# Comments From the Department of Defense



ACQUISITION AND  
TECHNOLOGY

## OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON DC 20301-3000

24 MAR 2000

Mr. James F. Wiggins  
Associate Director, Defense Acquisition Issues  
National Security and International  
Affairs Division  
U. S. General Accounting Office  
Washington, DC 20548

Dear Mr. Wiggins:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "(U) DEFENSE ACQUISITIONS: Need to Revise Acquisition Strategy to Reduce Risk for Joint Air-to-Surface Standoff Weapon," dated February 29, 2000, (GAO Code 707435)/OSD Case 1954).

The Department has reviewed the report and partially concurs with the report recommendation. The Department believes that the current JASSM acquisition strategy meets the GAO objective of closely linking the production decision to the knowledge points the GAO report references. The Department's response to the draft report recommendation is attached. Suggested technical and content changes have been provided separately.

The Department appreciates the opportunity to comment on the draft report.

Sincerely,

George R. Schneider  
Director  
Strategic and Tactical Systems

Attachment:  
a/s



GAO DRAFT REPORT – DATED February 29, 2000  
(GAO CODE 707435/OSD CASE 1954)

“DEFENSE ACQUISITION: Need to Revise Acquisition Strategy to Reduce Risk for  
Joint Air-to-Surface Standoff Weapon”

**DOD COMMENTS TO THE GAO RECOMMENDATIONS**

- (U) **RECOMMENDATION:** “The GAO report (Tab B), recommends that the Secretary of Defense direct the Air Force to revise its acquisition strategy for the Joint Air-to-Surface Standoff Missile (JASSM) to more closely link production decision to knowledge points. Specifically, in revising its strategy, the GAO recommended that the Air Force needs to take steps that will ensure, before beginning initial production, that (1) the missile design is stable, (2) its ability to meet performance requirements is fully established through flight testing, and (3) key manufacturing processes are under control so that the quality, volume, and cost of their output are proven and acceptable.”

**DOD RESPONSE:** The Department partially concurs with the report recommendation. The Department believes that the current JASSM acquisition strategy meets the GAO objective of closely linking the production decision to the three knowledge points identified in the above GAO recommendation. The Department’s position is based on the fact that the three knowledge points are at the heart of the current JASSM acquisition strategy. These knowledge points are directly linked to the JASSM Low Rate Initial Production (LRIP) Exit Criteria. At Milestone II, entry into the Engineering and Manufacturing Development (EMD) phase, the Under Secretary of Defense (Acquisition, Technology & Logistics) (USD(AT&L)), established explicit Exit Criteria (Tab C), against which to measure JASSM maturity before entering LRIP. The Exit Criteria directly link completion of events to the three GAO knowledge points. The Exit Criteria are a contractual requirement and are in the JASSM Test and Evaluation Master Plan.

Additionally, at Milestone II, it was decided USD(AT&L) would make the LRIP decision. To ensure the missile design is stable, the JASSM acquisition strategy specified that by Developmental Test Unit 4 (DT-4), the entire system (including missile software or hardware, test equipment, and mission planning software) would be production-representative with all manufacturing processes demonstrated on the DT missiles. DT-4 is prior to the LRIP decision. The Air Force will complete substantial subsystem testing and seven Contractor Development/Operational Tests of the production-configuration missile prior to the LRIP decision. This extensive testing will demonstrate that the missile design meets the performance requirements prior to the LRIP decision.

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**Appendix I**  
**Comments From the Department of Defense**

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In November 1999, USD(AT&L) approved a 10-month extension to the EMD phase of the program. Part of this additional time is to allow more test events and spacing between events to correct potential problems. Specific and measurable data points contained in the Exit Criteria will sufficiently support the LRIP milestone decision. The current acquisition strategy supports performance-based decisions and sufficiently covers the three knowledge points identified in the GAO report. JASSM is on track to accomplish the Exit Criteria prior to the planned contract exercise date of November 2001.

The Department acknowledges there is some cost risk associated with the JASSM acquisition strategy. The Air Force has firm-fixed-price contract options with not-later-than exercise dates. If the Air Force does not exercise the contract options by the specified dates, the contract prices would be open to negotiation. The Air Force is currently working with the prime contractor to reduce the cost risk associated with the not-later-than exercise dates.